

The PSYCHOLOGICAL RECORD

DECEMBER, 1942
Vol. V No. 8

TOWARD A SCIENTIFIC ANALYSIS OF MOTIVATION

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THE PRINCIPIA PRESS, INC.
BLOOMINGTON, INDIANA

Price of this number, \$1.00.

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TOWARD A SCIENTIFIC ANALYSIS OF MOTIVATION

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I. UNSATISFACTORY STATUS OF MOTIVATION PSYCHOLOGY

Impressive is the expanding place which the topic of motivation has been usurping in psychological literature during the last few decades. Besides occupying increasingly larger portions of textbooks the subject also affords scope for the production of books exclusively devoted to it (69, 73, 89).¹ It is not an uncommon opinion that today "no more promising subject of investigation in psychobiology can be found than that of motivation" (66). Examining the *Psychological Abstracts* for the decade 1928-38 we find a tremendous rise in the number of articles published in the periodical literature on the subject of motivation, drives, and incentives.

Unfortunately, this increasing interest in motivation is not correlated with a developing clarity concerning its nature. Granting that it deserves the attention devoted to it, it is still true that the psychology of motivation is in a deplorable state. Not only is motivation treated as (a) processes leading to (1) general action in organisms and (2) particular action in individual organisms, but (b) it is also extensively regarded as an explanatory principle for (1) psychological action in general and (2) particular types of psychological occurrences such as learning, choosing, feeling, etc.

This confusion prevails both with respect to (a) the identification and investigation of motivation data, and (b) their description and explanation. On the side of data it is not apparent whether one is investigating stimuli, responses, or conditions of stimulation or response, as evident in the great lack of uniformity in problems, methods, and research results. For instance, is motivation concerned with drives, intentions, incentives, purposes, goals, or achievements? On the side of construction, one is tempted to ask whether the net outcome of recent motivation investigation has led to improved

¹ At least as far as titles go. Actually, since the term motivation is conveniently used to represent anything that leads to action, the authors of such books have undertaken to discuss most if not all of psychology.

description and interpretation of definite psychological events or whether such events have merely had traditional explanatory principles imposed upon them.

That the "psychology of motivation" is dominated by traditional philosophical notions of cause or determination is amply indicated by considering the following questions. (1) Do we require forces or powers to account for psychological action? (2) Can psychological actions, which probably always consist of specific interactions of organisms with particular stimulus objects, be explained by putative psychic hormones or actual biophysical energy? Again, the extent to which motivation constructions are influenced by traditional theories comes to light by considering the question whether motivation is a new topic in psychology. Despite the apparent novelty ascribed to the subject² the discussion of motives and motivation is obviously a revival of an old interest. It is certainly not the case, as some hold, that the psychoanalysts with their doctrine of the Unconscious have initiated motivation studies. Nor is it more probable that the hormic or dynamic psychologists merit this credit because of their doctrine that mental forces are the sources of energy which set the ends and sustain the course of psychological activity (48). Both of these psychological trends reveal their direct descent from early philosophical traditions.

In the earlier phase of the present period of motivation no secret was made of the fact that the term *motivation* was simply another name for the venerable springs of action (69). Today the term motive bespeaks a blatant rechristening of the disreputable instincts (86). If this is the case, motivation studies represent a regression rather than an advance of the science of psychology. Certainly motivation discussion is replete with psychic powers and faculties as well as metaphysical potencies of all varieties. As to those writers who appear opposed to psychic powers some simply convert such forces by transparent verbal translation into physiological functions, biological needs, etc. (51, 66, 67, 71, 78), while others turn to such physical analogies as energy (29, 84, 89) which are not only extraneous and irrelevant, but, as simple causes, no longer are admissible in modern natural science.

² Troland thought it important to mention that his book (73) was the first to incorporate the word *motivation* in its title.

The subject of motivation, we conclude, has hardly attained a satisfactory scientific status. To a great extent because motivation is handled as a popular topic there is very little attempt to achieve exact scientific constructions concerning its existence, nature, and operation. Even when such fundamental analyses are attempted, the constructions fall far short of adequate scientific criteria. Can analogical references to machinery, energy, cosmic forces, structures and functions of organisms, teleological powers and similar factors do justice to concrete actions of organisms?

One of the primary bases for the unsatisfactory situation in the motivational field is that students of the subject do not begin their studies by isolating unique behavior events. Instead they start with the general interpretive assumption that actions require initiating or guiding forces or conditions. Hence motivation literature is replete with such traditional abstractions as urges and drives.

Indeed it would be no wonder if the studied avoidance of particular motivation events would justifiably lead one to doubt whether there is a well defined scientific problem of motivation at all. On the present uncertain basis it is inevitable, therefore, that extremely diverse views exist concerning the nature of motives or motivation. Thus in approaching the subject our first problem is not as in perceiving or learning, for example, to analyze and interpret a unique type of event, but rather to consider the more incidental question: What do psychologists understand by motivation or say about the subject?

Although from time to time we find writers (42, 49) pointing out the need for clarifying the motivation concept little heed is paid them. But it is not only the concepts (constructions) that require clarification. It is still true that the following basic and crucial questions demand answers. Are there any scientific motivation events and can they be isolated from everyday motivation circumstances? Again, is it possible to achieve scientific constructions to represent the nature and operation of motivation events? The importance of these questions arises from the fact that motivation problems must be considered upon the complex level of individual and social human activity as well as on the comparatively simpler nonhuman level of animal behavior. To obtain satisfactory answers to these questions and to follow through some typical problems in the motivation field it may be expedient to fit the motivation problem into the general framework

of scientific procedure as well as into the more specialized background of scientific psychology.

II. MOTIVATION AS A GENERAL SCIENTIFIC PROBLEM

Crude or Preanalytic Data. All scientific investigation begins with some primary contact with crude data. Every scientific enterprise implies that a scientist becomes interested in some circumstance or event which involves a problem of existence, identification, quantity, analytic or synthetic constitution, relation, etc. A frequent and important sort of interest is the establishment of the existence or nonexistence of some alleged object or entity, as for example, an electromagnetic ether or an ether-drift. In some cases the crude data may stimulate the investigation of the identity of some object accidentally discovered, as, for example, the mixture which Perkin afterwards identified as an aniline dye. Or the problem may concern some later-to-be-identified object, organism or condition involved in some disease, a virus or some sort of plant or animal organism, for instance. In psychological situations, of course, these crude or pre-analytic data always consist of some interaction between an organism and stimulus objects.

Although the psychological interaction is in all general respects similar to any other kind of interaction isolated from the general continuum of events there are obviously fundamental differential characteristics. It is these specific details which are of basic interest to the psychologist. As the accompanying diagram indicates (Fig. 1) the primary details consist of functions or operations of objects, organisms, and other event or field factors.*

Scientific Investigation. Contacts with crude-data situations constitute only the first step in the scientific process. This is at once followed by various sorts of operational interactions. Some of the earliest of these investigative processes consist of the analytic isolation, arrangement, and classification of the crude data. From these contacts are derived the analytic data, which may then be subjected to additional study. Further contacts with the analytic data are described as manipulation, observation or examination of events, or their experimental handling either *in situ* or in the laboratory. Naturally the particular operational procedures (dissection, calcination, calculation,

* The three diagrams mentioned in the text will be found at the end of the article.

solution, weighing) depend upon the worker's type of interest, crude data, hypotheses set up, apparatus available, and general investigative equipment. The results of such investigative contacts with crude data constitute the content of the scientific protocol.

In short, the investigative phase of science may be summarized as a scientist's interbehavior with an event. For the psychologist it constitutes a scientific field in which the investigator interbehaves with the interbehavior of the organism and the stimulus object, which may, of course, be another person. The investigative event or field is illustrated by the accompanying diagram (Fig. 2).

Scientific Construction. On the basis of such investigative contacts the scientist next constructs in series: (a) simple and complex descriptions of the events studied, and later, (b) interpretive and explanatory theories concerning these events in their interrelationship with still other events. It is hardly necessary to mention that from the event continuum one may isolate for study either (a) a unit event, (b) a thing, or (c) a cause or condition factor of an event.

Carefully to follow out this design for scientific work will aid in differentiating between (a) data or events, (b) investigative operations and procedure, and (c) various constructions, whether statistical, descriptive or interpretive. But there are also more specific advantages. For example, such a blue print may assist in determining to what extent events are original or patinated—that is, endowed with the results of previous contacts with them. Since scientific contacts with events are generally preceded by various casual contacts the question always arises how much the original events have been overlaid with properties attributable to such prior contacts. Obviously when possible such patination may be removed by various instruments and techniques. We should not overlook here the difficulties engendered by the properties accruing to data because of the types of apparatus and the techniques employed in specific investigations of events.

Perhaps a more important advantage is the service such a design renders in avoiding errors involved in the ascription of characteristics to events by custom and tradition whether or not complicated by actual prior contacts with them. In point here is the scientific constructional problem whether the descriptions and explanations are derived from the events through investigative processes, or whether they are imposed upon the events from sources partially investigative

and partially or entirely traditional. The accompanying diagram (Fig. 3) illustrates these inexhaustive possibilities. It may well be assumed that the first of these possibilities yields the best scientific results.

On the whole, constructions derived from events are likely to be legitimate, whereas those imposed upon events will only by the merest chance be anything but illegitimate and useless. When astronomers construct their descriptions on the basis of star and comet movements they are more likely to assert that their orbits are oblong or elliptical instead of circular as they do when they start with the tradition of the perfect figure. When the physicist begins with falling bodies he is more likely to develop a law of the interaction of bodies in a field than when he simply applies to them the principle that bodies always act as they do because it is their inner or teleological nature to attain a prescribed goal. When psychologists construct their descriptions and theories from their observations of organisms interacting with objects they will hardly have a basis for the illegitimate concepts of psychic or physiological forces.

Applied to motivation problems, the question is asked when observing a person acting whether it is a motive action or whether we merely ascribe the motivation factor to it. Again, the inquiry is made whether and how much we endow the action by naming it in a certain way or by placing it in a certain class or group. Naming an action is a process depending upon direct or indirect interaction with it; thus we may be influenced in our studies by having previously named the crude datum.

In general the value of this scientific model lies in the control it affords over the arbitrary factors in scientific work, whether in the (a) selection of data and problems, (b) setting up investigative techniques, and (c) constructing interpretations and theories. Basic to this entire design with respect to motivation studies is the accent on specificity of observation and construction which leads to the following results.

A. On the side of Data.

- (1) Making certain of a definite datum.
- (2) Distinguishing events from constructions.
- (3) Separating crude from analytic data.

- (4) Distinguishing between psychological and non-psychological data, for example, separating events belonging to the domains of psychology, biology, and physics.
- (5) Keeping psychological events or interactions distinct from phases of such events.
- (6) Specifically separating events from conditions.

B. On the side of Investigation.

- (1) Distinction between protocols obtained from biological and psychological studies.
- (2) Distinction between operations upon data and setting up demonstrations of accepted constructions.
- (3) Distinction between types of investigation and results of (a) biological and psychological studies, and (b) motivation and other events similarly named.

C. On the side of construction.

- (1) Separating description from ascription.
- (2) Separating analogical statements from description of events.
- (3) Extrusion of construction involving forces and powers in favor of the interrelation of factors in a field.

With this brief sketch of the scientific enterprise before us we proceed to examine motivation studies beginning with data, then proceeding through investigation to description, interpretation, and explanation.

III. MOTIVATION DATA

A. ARE THERE DEFINITE MOTIVATION DATA?

In carrying on his work a scientist interacts with some actual or alleged event. In the former case the investigation concerns the nature and operation of an event; in the latter, the problem of existence or occurrence. Now what are motivation events? Assuming that a psychological event consists of an interaction of an organism with some stimulus object under specific conditions we do not find in the literature any clear-cut distinction of a motivated from

a nonmotivated event. Current writings on motivation certainly do not indicate any agreement concerning the existence or nature of such events. Not only is this true for particular writers, but the difficulty is intensified by the disagreements among different writers. We are therefore not surprised if this situation prompts the question whether there are motivation data at all.

Though lack of agreement on the part of psychologists may not be prejudicial to the existence of an event nor to the possibility of discovering its nature, it is true that writers on motivation discuss every possible type of subject under this one heading. In other words, under the influence of particular theories, attitudes, and educational and cultural backgrounds, the term is employed to refer to a tremendously large number of referents. Prominent among such referents are indifferently: (a) every type and variety of human and infrahuman action, (b) causes of action, (c) forces and powers originating action, (d) conditions of action, (e) stimuli, (f) incentives, (g) ends of action, (h) terms describing action, etc. It is clear, too, that the nature and location of the referents are sometimes influenced by the use of the term motive or motivation.

Undoubtedly in the background of motivation studies there is a sort of unifying ideology. True enough, writers on the subject are dominated by the traditional notion of action movers. But this fact is itself responsible for the excess of indiscrimination in data selection. How indiscriminate is the grouping of motivation data may be illustrated by the two following sample lists.

Sample I (69)

Cosmic forces	Economics	Personality	Love
Reflexes	Pain	Prejudice	Values
Habits	Inertia	Principles	Domination
Instincts	Interest	Subconscious	Disillusionment
Fatigue	Will	Morale	Pride
Emotions	Choice	Discouragement	Flattery
Feelings	Aesthetics	Group	Conscience
Ideas	Despair	Telepathy	Ritualism

What greater lack of selective discrimination could be illustrated! The basic procedure seems to be the juxtaposition of as many physical,

biological, and psychological categories as possible, as though motivation were anything in the way of a psychological or related fact. Our interest is not in questioning the propriety of making motivation equivalent to psychology, but rather in suggesting that the lack of any particular type or class of event precludes the initiation or prosecution of any scientific enterprise.

Hence if we are to achieve a scientific orientation toward motivation data must we not isolate motivation events in an analytically satisfactory manner? Only by doing so can we investigate them effectively and build up an adequate theory concerning them. The compiler of this list does not even abide by the mover idea, since it contains names of acts instead of movers of acts. Moreover, it includes the so-called negative movers, pain, inertia, fatigue, etc., which prevent action.

Sample II (53)

<i>Visceral Drives</i>	<i>Activity Drives</i>	<i>Aesthetic Drives</i>	<i>Emotions</i>
Hunger	Exercise	Color	Fear
Thirst	Rest	Tone	Rage
Air-getting	Preservation	Specific qualities	Disgust
Temperature-regulation	Rhythm	of taste, smell, touch	Shame etc.
Sexual etc.	Novelty Exploration etc.	Rhythm etc.	

Though admittedly the second list is much more discriminating than the first it still leaves open the question whether there are motivation and nonmotivation events. The proponents certainly attempt to reach some principle of action and do not include every possible name found in psychological treatises. In addition they specifically state they are seeking the biological motives or drives for psychological action. Nevertheless, the cause or motive-power idea interferes with adequate data selection. For example, the list includes most of the stimuli of traditional psychological treatises. Furthermore, actions, including rest and emotions, are themselves proposed as motives for action. Even though the present compilers are dominated by the concept of motive-power they cautiously hesitate to assert that the juxtaposition of acts implies that one causes another.

B. MOTIVATION DATA AS PREANALYTIC EVENTS

Scientific data not only must be selective but analytic as well. Before a scientist can operate upon events they must be sharply defined. Even though the data consist of everyday activities they must be significant and more or less exactly described if they are to be the basis for theory or explanation. Also it is necessary to determine interrelational effects among such data. Here lies the basis for the common belief that scientific data must be quantitative. Doubtless this term refers merely to the facts of sharp definition, isolation, and analysis for purposes of systematic organization.

To a great extent psychologists concern themselves too much with events of everyday life and not enough with scientific data. In other words, motivation literature leads one to believe that the term refers mostly to prescientific or nonanalytic events. For example, psychologists occupy themselves with the problem of Mr. X who turns from the activities of amassing a fortune to the acceptance of a political appointment that will decrease instead of increase his income.

The need for analytic data for motivation study is sharply indicated by the indifferent location of the essential motivation datum in nonanalytic events. Actually we find the essential datum located both outside and within the motivated individual.

(1) *Externally Localized Motives.* In the light of motivation literature, motivation is something one does to a child to secure desired though not necessarily desirable results. Put pictures in his primer; make his arithmetic problems center in baseball, etc. In adult situations motivation is a term used for the attempted influence of workers by offering them bonuses. So far the descriptions refer to activities performed by operators who set conditions in order to induce changes of action in the individuals operated upon. The latter are regarded as more or less passive subjects to be motivated. At most the actions of the subjects are modified by being brought into contact with incentives.

(2) *Internally Localized Motives.* In other cases individuals are considered as possessing or displaying motives. Psychologists frequently follow the lead of detectives who persistently search for the motives of crime. A robbery or a murder is committed and the detective is hot on the trail of someone who might have a motive for such

an act. Was it revenge? Fear? Need for money? And so forth. A respected banker is a bit short in his accounts. *Cherchez la femme*.

Though we cannot but conclude that such situations undoubtedly contain some authentic scientific event it still appears true that to a great extent motivation is treated on popular rather than scientific lines. That is, if the psychology of motivation is concerned only with such surface aspects of events as we have indicated, one may well question its scientific character. Granting that psychological data are derived from concrete facts of life, from everyday occurrences, still if these facts are to be scientifically treated we must discover some series of basic factors. The detective's explanation of omission or commission acts is no closer to the psychology of motivation than the observation of a moving automobile is to the physics of rectilinear and rotational dynamics, or the observation of someone's consumption of coffee and rolls to the study of biochemistry. It is indeed unfortunate that because of the intimacy of psychological behavior we use the term psychological both for crude events and for the investigative science of those events.

Until we discover basic and unambiguous motivation data the term motive is simply a popular word without any analytically determined referent. Though there is a definite continuity between scientific and everyday events, it is possible and necessary to differentiate between what may popularly be called motivation and the materials scientifically isolated for analysis and investigation.

C. CONFUSION OF EVENTS AND CONSTRUCTIONS

Not all psychologists, of course, are guilty either of not discriminating nonmotivation from motivation data or not analytically isolating events. But here the pitfall is that frequently they achieve such data by substituting constructions for the original events. Analytic psychologists regard themselves, then, as studying driving forces, causal psychic forces, physiological determiners or general effectors of action. Such admixture of construction and events in several ways has an unsatisfactory influence upon investigation and the interpretive construction of motivation descriptions and theory. It does not allow for the elimination of occurrences falling outside the range of investigation nor of actual events which do not present scientific problems.

An excellent illustration of the projection of constructs into data-events centers about "intervening variables." As Muenzinger (52) describes such items they are variables or facts in behavior that are not immediately observable though they emerge by grouping observable factors. Whether or not such variables are regarded as factors in events there is no question that motives thus envisaged are constructs and not original data. Stone (66) declares flatly that drives, like forces in physics, have only conceptual as opposed to phenomenal reality.

D. CONFUSION OF PSYCHOLOGICAL AND NONPSYCHOLOGICAL DATA

An outstanding difficulty in dealing with motivation data is the substitution of biological for psychological events. Though writers on motivation are certainly committed to the study of psychological events they find themselves emphasizing *motives* as the biological activities of hunger contractions, thirst conditions, and reproductive processes. Two definite circumstances lead to such substitutions. In the first place, writers dominated by the assumption that motives are determiners, yet wishing to avoid psychic powers, resort to biological processes as their data. Secondly, they assume that these biological processes or needs are connected with and lead to other activities. For example, food and sex hunger are presumed to cause uneasiness and movements toward relieving such uneasiness and obtaining food and sex satisfaction.

E. MOTIVATION DATA AS FACTORS OF SINGLE EVENTS

Not unrelated to the above confusion is the transformation of a factor of an interbehavioral event into a mover or determiner for the remainder of the event. When an organism is observed to interact with some stimulus object, some particular phase of the whole single event (organic condition as part of the response pattern, other person's presence) is regarded as the motivator or mover of the total action on the basis that motivation involves a constellation of factors. As we have already indicated, stimulus objects or incentives are also considered as the distinctively motivational data. In other cases the setting which is always a part of a total psychological event is taken to be the motivating factor. In all these instances the selection of

the motivation factors results from an arbitrary assumption that what the organism does must be accounted for by some part of the total behavior event.

F. MOTIVES AS ACTS AND CONDITIONS

It is doubtless a legitimate procedure to analyze a behavior segment or interbehavioral field into interbehavioral factors proper and a set of conditioning factors. The latter may be regarded as facilitators or retarders. The potentiality and variability of performance of a given behavior segment depend upon various conditions. Accordingly it is entirely proper to look upon motivation as the conditions surrounding the event rather than the more central activities of the interacting organism and stimulus objects.

When isolating motivation data we must not, however, consider conditions as anything more than factors in a total behavior segment. Plainly speaking, we must avoid regarding conditions as moving powers or determiners when they are only factors in a system of interrelated components of a large complex event. There is danger here not only of substituting an interpretive construct for a datum, but also of injecting into occurrences unnecessary powers and forces. As we have pointed out, the student of motivation, as of any other psychological happening, interacts with an interbehavioral event in progress. Hence it is highly desirable to distinguish between genuine and spurious conditions.

IV. LINGUISTIC FACTORS IN MOTIVATION STUDY

Since man is so essentially a talking animal it is inevitable that language should interpenetrate most of his other actions. This is no less true of his scientific than of his other behavior. Linguistic action and linguistic products exert their influence upon the discrimination, selection, and patination of objects and events and obviously upon the style and efficacy of recording them. When we observe how largely linguistic events are intermingled with the investigation and construction phases of scientific work, we can easily appreciate the potentialities of language for good and evil.

Linguistic problems in science are no new discoveries. For centuries writers have pointed out that confusions and errors creep into scientific constructions because of terminological influences. Thus it

may be of distinct advantage for the clarification of motivation situations to make a linguistic examination of various constructions.

As our general design of study has indicated, interbehavior with events constitutes the source of constructions and the criteria for their character. In other words, scientific work consists primarily of operations upon events and not upon constructions. Thus we grant only a greatly restricted approval to the recently developed notion that problems in science can be solved by semantic analysis or the examination of sentences and their so-called logical structuralization. Nevertheless, since linguistic behavior constitutes a large portion of at least auxiliary actions in our contacts with things, scientific investigation is surely influenced by linguistic phenomena.

The scope of this influence is revealed by the kind of treatment accorded linguistic problems in scientific work. On the whole, students of language have been interested in two distinctive forms of language problems—namely: A. semantic or linguistic analysis, and B. sententics or linguological construction.

A. *Semantic Analysis.* This phase of linguistic study is primarily concerned with the relation of terms or symbols and their referents. In the case of scientific work the referents consist of events. Linguistic analysis can serve two functions in science: (1) monitorial, indicating the care one must take in preventing constructions from interfering with observations, and (2) directive, designating the more positive ways of handling constructions. In the following paragraphs we point out the employment of these functions in motivation studies.

(1) *Distinguishing between term usage or word constructions, and the things or events described.*

Because all scientific results constitute constructions a basic monitorial device is to make certain that we do not confuse the description with the thing described. This confusion works out in the assumption that whenever we have a name there is also a thing which it represents. In motivation discussions this assumption is illustrated by the imposition of some motivation power or factor upon some event. For example, when an animal is in a situation in which it can move toward either one or another kind of food there is at once said to be a stronger motivation in the direction of x rather than y.

Many of the errors of reification likewise illustrate this point. Sometimes the inadvisability of a substantive instead of a verbal term implies there is some force, power or faculty called motivation which governs behavior events. The directive function in this instance is to enforce the rule that descriptions are to be derived from the events. This may mean exclusion of the assertion that the animal is motivated, or insistence that the whole event be described as the actions of the animal in connection with the food objects. The monitorial function then may be generalized as simply keeping the factors in the situation clear, whereas the directive function aids in the selection of the proper factors for scientific investigation and interpretation.

(2) *Distinguishing between autistic construction and genuine reference to events.*

Here the different operations of language are distinguished. For example, one may actually refer to existing or observed events or speak or write more or less independently of events. In the latter case it is possible to simulate references to events even though there are no such happenings. In this instance the construction is autistic. Whoever asserts that all organisms display the universal motive of self preservation illustrates this language behavior. Again, the ability to talk about various things allows one to connect them in speech without regard to events. One may say the animal chooses or prefers something instead of simply referring to what the animal does. When, however, we derive the linguistic construction from the events we are able to avoid this sort of semantic error.

(3) *Making certain that what one describes and uses terms for, actually exists and is observable.*

The discussion of urges, impulses, drives, desires, etc., in motivation study illustrates the need for this monitorial function. No doubt in some cases these term-usages constitute fairly legitimate metaphorical references to events. In other instances, however, the term-usages are entirely independent of anything that happens. As such they constitute altogether conventional propositions without regard to any observed event. A crucial instance of this error is the obvious use of a new name for some old and abandoned idea; for example, the term motive itself is certainly a new name for instincts.

(4) *Differentiation between the adequate description of some event and the ascription of the results to something else.*

Frequently in motivation discussion we observe that an adequate description of some event is transferred to another alleged event and by this means the conclusion is reached that the alleged event actually occurs. For instance, by describing well some reflex-action mechanisms psychologists regard themselves as establishing the existence of various powers or faculties called instincts, drives, urges or motives (85). Here the procedure is to describe the existence and operation of certain structural organizations—for example, the reflex action of the lungs in breathing, the stomach in digesting—and then to transfer the description to complex actions, fighting, etc., in order to assume that there are all sorts of native and acquired modified mechanisms for such actions. Helpful here too is the identification of the term mechanism with set or disposition to act, and regarding such a mechanism when operating as a drive.

Similarly, certain biological processes are described, such as the metabolic activities of the organism, after which it is assumed that the description establishes psychological motives and other driving forces (29). In this case the chemical energy of food which drives the animal organism is presumed to be the prototype of all sorts of drives in the comparatively simple situations of animal existence as well as in the relatively complicated affairs of human life.

In general, the linguistic processes exhibited in these constructions consist of a series of verbal equations. Biological structure is equated with mechanism. Mechanism is equated with disposition or set to act. Energy is equated with drive. Drive is equated with motive. Other comparable equations consist of connecting the how of action with the why. To observe the monitorial and directive functions of linguistic analysis surely ought to be helpful in avoiding the dangers of irrelevant analogy and the precarious transference of constructions from one situation to another.

(5) *Distinguishing between popular and scientific terms.*

Probably because psychological phenomena are so intimate, terms of popular usage insinuate themselves into scientific description as analytic constructions. We have already seen that probably a large portion of motivation literature is built upon this failure to observe

the admonitions of linguistic analysis. Possibly the most crucial violation of this principle is making use of the popular term *conditions* to establish the presumption that there are analytic events requiring description as motives or forces.

B. *Sententics*. On the whole, sententics may be differentiated from semantic or linguistic analysis on the basis that the latter is more intimately related to events. In other words, whereas linguistic analysis is more concerned with problems of proper designation, with the adequate correlation of terms and events, sententics or linguologic has to do with the relatively more remote interrelations of linguistic propositions. Accordingly sententics deals with a more elaborate level of the constructive stage of science. Sententics in science may be described as the processes involved in the organization of propositions in theory construction. So far as precautionary functions go, sententics like semantics may operate in both monitorial and directive circumstances. Despite the close interrelations between the two, sententics is presumed to avoid the difficulties localized in organizations or systems of propositions and not in single terms.

The following illustration of a sentential fallacy in a propositional system indicates both the process of sententics and its precautionary functions.

Let	$a = b$
Then	$ab = a^2$
Subtracting b^2 ,	$ab - b^2 = a^2 - b^2$
Factoring,	$b(a - b) = (a + b)(a - b)$
Dividing by $a - b$	$b = a + b$
But,	$a = b$
Therefore,	$b = 2b$
Or,	$1 = 2$

The fallacy, of course, is slipping in a division by $(a - b) = 0$ which is a propositional process not allowable in the system.

Although linguological processes may be of considerable value in theory construction the relative remoteness of the developing system from the original data allows innumerable fallacies to creep in. As a matter of fact, in the motivation field, sententics is fundamentally characterized by paradoxes. Sententics originated as a crucial study of language constructions for the purpose of distinguishing between

constructions with and without definite referents. Now sententics is employed to establish various faculties, forces, and powers in motivation discussion (38). There is a magical procedure here. By the employment of conditional reduction sentences and other linguological devices one may include faculties in motivation discussion.

The general procedure is as follows:

"Let Q_1 be 'placing X (at time t) at start of alley containing food and mate'; let Q_2 stand for ' X chooses the food'; finally let Q_3 stand for the statement ' X 's hunger motivation is stronger than his sex motivation at time t .' ($\neg Q_2$ will mean either that X chooses mate or X shows no interest in either goal object.) We may now write:

$$Q_1 \supset (Q_3 \equiv Q_2),$$

which may be read: 'If we place X in the specified maze at time t , then X 's hunger motivation is stronger than his sex motivation if and only if X chooses food' " (38, p. 31).

A pointed question arises here: Does this descriptive or designative construction add anything to the scientific construction? The writer freely grants that a symbolic construction may be very useful in checking the terminology of the *statement* of findings, but *noblesse oblige*. The potentiality for good carries within itself also the potentiality for evil. For example, let Q_3 stand for the statement " X is possessed by a hunger rather than a sex demon." The whole sentence will now read: "If we place X in the specified maze at the time t , then X is possessed by a hunger demon if and only if X chooses food." How will the organization of symbols help that case?

Of course the sententologist assumes that he is sensitive to the content of the sentences. But if he is, then where is the gravamen of the construction? In the linguological character of the symbols or in the prior observations or investigations?

Consider another instance of the reductive sentence. Let Q_1 be 'removing pigeon X to such and such a distance from his nest, Q_2 ' X returns to nest,' and Q_3 ' X 's behavior as determined by his "homing instinct"' (38, p. 37). If the sentence is regarded as justifying instincts it is obviously a self-condemned device. But if Q_3 is taken to represent some still unknown set of interbehavioral conditions involved in the pigeon's return to its nest and which may be later discovered, then it is unobjectionable. It is evident, however,

that the propriety of the sentence can only be established by discovery or investigation, not by any linguological device.

Inherent in linguological thinking is the danger of erroneously assuming that by examination of language or by the proper construction and interrelation of sentences one can substitute for observation and investigation. Whether or not one should include certain constructions in motivation study is not to be determined by the proper structuralization of sentence-systems, but rather by evaluating such structuralizations in terms of the descriptive and applicative functions of scientific work.

Linguologists on the whole are deductionists. They are ambitious to attain systems so they can simply infer events. But here it is pertinent to ask how effectively one can infer events from sentences. As we have already indicated everyone must admit that the value of sentence systems is derived from their faithful adherence to events. This applies to systems of mathematical equations as well as to text, symbolic, and other propositions. Unless, then, the deductions are based upon a knowledge of the events the proper sentential construction can be of little avail. Undoubtedly, too, the help that can be derived from valid sentence systems can apply only to the elementary scientific processes of classification and selection and not basic discovery.

V. MOTIVATIONAL INVESTIGATION

Without entering into an analysis of the method and technique of investigation we may assume that it constitutes a means to the end of achieving an orientation toward certain kinds of events. The scientist's aim is to build up a set of significant constructions which enable him to understand events and when desirable to predict and control them. The selection of data and the operation upon them, whether ordinary observation or experimental manipulation, are designed to discover basic principles.

Psychologists possibly more than other scientific workers act on the common and perhaps justifiable belief that one may proceed with experimental investigation even when one is unable properly to isolate and analyze events. The rationale of this belief is that perhaps by means of such investigation or manipulation the events studied will become clear and definite. In other words, it is assumed that simply

by getting into contact with things the understanding of their characteristics will proceed apace.

Now it is undeniable that sheer manipulation or trial and error is a useful and even necessary procedure in the early stages of investigation. This is true especially when the study involves problems of existence and identification. Because of so many accidental discoveries in science one may feel safe as long as contact is maintained with crude data.

But in later stages of scientific work this trial and error procedure is not permissible. A time soon comes when the worker must be able to set up definite hypotheses and proceed to test them. In the study of motivation the time has long passed when crude manipulations have any value. Plunging into investigation without a prior careful selection of data has resulted in the grossest confusion. This fact is revealed by a brief examination of the scope and significance of a typical set of investigations.

Further, this examination reveals that students of motivation lump together all sorts of studies as illustrations of the operation of motives or drives. In justification of this procedure such students assume that there is a fundamental goal sought by the investigators of motivation—namely, the discovery of the causes of action. As Troland (74) says, motivation psychology broadly and scientifically considered deals with all the determinative functions and dynamics of mind. In general, motivation problems lead to the quest for explanations why individuals behave or desire in particular ways.

On the whole, the impact of this view upon motivational investigation results in two equally unsatisfactory situations. In the first place, motives become regarded as general forces or powers determining actions or serving as explanations of actions. The difficulty here is that whether the determining forces are taken to be psychic or physiological, there is no definite datum for investigation. In the second place, when the investigations are limited to the conditions of particular activities, there is still no definite psychological datum isolated for investigation.

While space does not permit a comprehensive survey of investigations classified under the heading of motivation it is informing to indicate the indiscriminate range of actions covered by motivation studies. These may be grouped as (A) studies stressing actions and

primarily principles of action—motives, drives, etc., and (B) studies of what are regarded as more definitely conditions for action.

A. Comprised in this division are studies of both human and nonhuman animal behavior.

(a) Nonhuman animal behavior.

Students of animal motivation (67, 89) have collected all sorts of investigations of animal reactions some of which clearly constitute only ordinary responses to externally or internally located stimuli, while others perhaps are predominantly biological and not even definitely psychological events. It must be remarked that in some cases the investigators have not themselves been especially concerned with motivation problems.

(1) Food preferences. As evidences of drives writers on motivation cite numerous investigations of simple food preferences, and studies showing that animals choose the foods they require for hunger satisfaction, nourishment, and growth (7, 22, 56, 57, 62, 87, 88).

(2) Sex behavior. Included among motivation studies are (a) investigations of general sex behavior, (b) studies showing the relation between sex action and chemicals of the reproductive glands, and (c) the investigation of the learned or unlearned character of sex action (64, 65, 66, 78).

(3) Maternal behavior. The investigation of the behavior of animals with respect to their young and other objects. These studies include retrieving the young, nest building, suckling the young, etc. (26, 30, 36, 70, 83).

(4) Thirst behavior. Various activities of animals have been investigated as manifestations of a distinctive thirst drive or motive (21, 55, 79).

(b) Human animal studies.

As one would expect, the more complex activities investigated in human situations consist primarily of applying certain stimuli or arranging certain settings for the performances. The assumption is made, however, that these stimuli and settings elicit and control the operation of motives. A typical list of human motivation experiments is that given by Bills (11), and Diserens and Vaughn (17). The underlying idea of incentive and motive is that of inducing or instigating action or exertion in oneself or others.

(1) Competition and rivalry. Various activities are included here; for example, (a) groups of individuals compete against other groups; (b) individuals compete against other individuals; and (c) individuals attempt to better their own previous performances (32, 82).

(2) Working with or without knowledge of result. Various sorts of performances are compared when the persons concerned can or cannot see what results they achieve (6, 15, 25, 34, 58, 63).

(3) Praise and reproof. The investigations here concern the comparative effect upon school performance of boys and girls when praised or reproved for adequate and inadequate achievement (12, 24, 31, 43).

(4) Favorable and unfavorable criticisms. Studies are made of the influence upon performance of complimentary and uncomplimentary comments (23, 40).

(5) Mode of instruction. Are individuals better motivated by positive or negative instructions? Are persons more likely to do better when threatened or cajoled? These questions illustrate the type of study made under this classification of motives (41, 76).

(6) Reward or punishment. Numerous and varied investigations on children and adults have been conducted to ascertain the motivating influence of rewards and punishments in different situations (school, industry). Subjects have been stimulated by candy, wage bonuses, electric shocks, etc. (13, 37, 43, 54).

B. When experiments are more definitely designed to investigate conditions of action, studies are made of the effects of all sorts of factors—for example, stimuli, responses, incentives, instigations, biological acts and conditions, as well as circumstances surrounding the affected behavior. The point is illustrated by the following samples of studies.

(a) Effects of physiological conditions and actions of the organism. In animal investigations (learning, etc.) hunger, thirst and sex needs have been studied as motives or primary drives (43, 59, 61, 68).

(b) Incentive effects. Many sorts of objects and conditions, foods, mates, and rewards of all kinds, have been regarded as inciters or facilitators of action. It has become conventional to refer to these conditions as environmental or secondary drives (25, 39, 42).

(c) Effects of inhibitions. Punishments and obstructions have been extensively applied in motivation situations in order to study the strength of drives (28, 77).

(d) Relative influence on behavior of different stimuli. A prominent place in motivation studies is given to the relative effects of stimuli as inciters to action (18, 19, 20, 50, 51, 75).

(e) Effects of general surrounding conditions. Atmosphere and temperature conditions are studied for their influences upon the organism in its learning or other adjustments (80).

(f) Effects of presence or absence of other persons. So-called social facilitations and inhibitions have been regarded as social motivation (1, 16, 27, 44, 45, 72).

(g) Effects of fatigue and bodily conditions induced by drugs. These circumstances are also cited as motivating factors (8, 35, 46, 81).

(h) Effect of previously present biological condition. Rats trained on a maze with hunger and reward control and later trained on another maze without the hunger and reward are reported as learning in the second situation on the basis of the first. The drive is said to become autonomous and externalized (4, 5).

Our general conclusion with respect to motivation investigation must be that whereas numerous facts of various sorts have been collected, of which many are important as well as interesting, hardly any basic understanding of a distinctively motivation type of event has been achieved. When "motivation" studies indiscriminately cover (a) native or biological action (for example, nutritive behavior), (b) tissue needs, (c) behavior settings which facilitate, retard and inhibit action, (d) purpose or explanation of behavior, (e) goals of action, and (f) various organic, stimulating and hygienic factors or conditions of action, it is unlikely that basic principles can be arrived at. Even when situations involving motivation have been assiduously investigated the studies have hardly penetrated the surface of the crude data. So far no fundamental motivation principles have rewarded the workers in this domain.

Should the question be asked how so much experimentation can be done without a critical selection of data, the immediate answer is that numerous variegated studies can be carried on by simply subsuming them under a chosen class name. Though a psychologist may

firmly believe that there is no such event as an attention span, he may still study reactions under that name. Without acknowledging the existence of "emotions" one may nevertheless be interested in recording certain physiological changes under a specified type of behavior stimulation. Actually, numerous experiments quoted under motivation headings constitute investigations of varying forms of stimulation or incentive. Also there are studies of inhibiting effects on action under different stimulation. In still other cases we have investigations of types of barriers influencing behavior. The question is whether there is any unique phenomenon which under strict conditions of designation or definition should carry this label.

Everyone is familiar with the fill-in technique which consists of a simple substitution of a question we can answer for one we cannot handle. For example, when we are unable to describe or explain vision we proceed to discuss some points of physics, anatomy, and physiology. So here, we may begin with a popular notion concerning the existence of a motivation event and proceed to experiment upon a heterogeneous series of happenings on the pretext of investigating the nature of the alleged event.

VI. INTERPRETATION OF MOTIVATION

Although scientific investigation consists primarily of a mode of interaction designed to elicit the properties and character of events, it is apparently impossible to avoid the prior charging of data with various amounts of construction. As far as possible, however, protocols or the recordings of findings should contain a minimum of construction. Hypotheses which are the inevitable guides to investigation should be based mainly on events and their conditions. The first definite step in construction may properly be named interpretation.

The interpretive phase of the scientific enterprise may well be characterized as an attempt to describe or evaluate events based upon research findings. Essentially this is a process of developing a preliminary orientation toward the nature of an event under investigative conditions—how it operates and in what quantity. This orientation is expected to take account of the influence of apparatus and technique upon the results of the scientist's contacts with events. By comparison with explanation or the relating of events to each other, interpretation is a lesser form of construction. This is the case whether we

regard the related items as factors of a single field or as different fields linked in contextual relation.

Motivation interpretation appears to be in just as unsatisfactory a state as the analysis and investigation of the motivation event. Since there is no critical isolation of data such as the differentiation between motivated or nonmotivated events we can only expect unsatisfactory interpretational results in both experimental and nonexperimental situations.

Experimental and Nonexperimental Interpretation. Although interpretations of motivation antedate experimental work there is a definite continuity between the interpretation of motives in a historical sense and the interpretation of the results of experimental studies. This continuity is exemplified by the fact that the interpretation of experimental work on motivation is for the most part the imposition of evaluations derived from the pre-experimental period. Perhaps the outstanding differences between the two periods is that in the pre-experimental one evaluations were primarily in terms of subjective or mental factors, whereas in the experimental era the interpretations constitute constructions couched in objective and even physical terms, such as energy.

On the whole, motivation interpretation takes the form of an attempt to account for the general occurrence of behavior or the rationale of its operation, though in some instances motivation is interpreted as the basis for some particular type of action.

In the pre-experimental period motivation interpretation took the form of some general power or force which makes things happen, stateable in general cosmic terms, *élan vital*, libido, etc., or connected with particular individuals such as in the historic springs of action, pleasure, pain, etc.

Types of Motivation Construction. Scanning the literature on motivation we find that the nature and operation of actions have led to the construction of numerous concepts or terms. The following list indicates the more popular of these and the types of actions or attributive analogies from which they are derived.

- (a) Facilitating conditions, e.g., rivalry, proper setting, etc.

Variability of actions in the presence or absence of people, etc.

- (b) Motive power, e.g. energy.
Analogy of food in making action possible.
- (c) Organs or causes of action, springs of action.
Preparedness or set for action, propensities, urges, etc.
- (d) Preferential action.
Choices of food, objects, etc.
- (e) Organic conditions of action.
Health, age, toxic condition, etc.
- (f) Explanations of action.
Assumptions why action occurs.
- (g) Ends of action.
Results of performances.
- (h) Purposes and intuitions.
Orders and connexities of action.

Three Motivation Variables. Especially since the experimental period, motivation has been interpreted on the basis of a biological analogy, so that the springs of action have been located either (a) in the organism, (b) in the surroundings of the organism (environment) or (c) in a set of conditions presumably involving both (a) and (b).

(a) The organismic variable for the most part is interpreted as some sort of power or cause of action which accounts for the event happening at all, though sometimes it is presumed to explain the particular kind of behavior. This variable is illustrated by a hungry animal which turns toward food rather than toward an opposite-sex animal. When an animal persists in moving toward a stimulus object despite a painful obstruction or impediment, that is an evidence and measure of some sort of drive depending upon circumstances. Such interpretations are made upon the basis of the animal's condition or the stimulus object. It is only a preferred interpretation not to regard the experiment as measuring some property of the stimulus object. When an animal persists in lying in the maze instead of running through it, this must no doubt be interpreted as the drive being at rest or perhaps there is a rest drive operating instead of a running drive.

Young (89) offers six interpretations of the character of organismic motives or drives.

- (1) The energy which moves the body.

- (2) Internal stimulus or tissue condition which produces energy and leads to activity.
- (3) General activity as indicated by variations of performance in an activity cage.
- (4) "Behavioral tendencies," for example, playfulness, laziness, sociability, restlessness, etc.
- (5) Specific goal-directed activities such as food-seeking or mate-seeking.
- (6) Interests, purposes, wishes.

(b) The surroundings variable generally referred to as an incentive also induces or touches off action whether a general or specific event. Here again the term incentive is used to designate many different factors. Young (89) mentions:

- (1) Goal objects such as food.
- (2) Painful stimuli which evoke "negative" but heightened action, whip, spur, electrical shock.
- (3) Facilitating or inhibiting factors such as praise, reproof, reward and punishment, knowledge of performance, merit, amount of work, etc.
- (4) Background factors—temperature, humidity, illumination, noise, etc.

(c) The conditions for the most part are presumed to account for levels, amount or intensity of action. On the whole, the conditions interpretation departs most from the traditional notions of general cause or power of action. There is probably less objection therefore to the evaluation of motivational processes as conditions of action. Indeed this fits in with the general attitude of psychologists that motivation is a phenomenon of conditions and that the term motivation should refer to the why or explanation.

The interpretive improvement clearly called for is the extrusion of the why concept in favor of an analysis of genuine factors in a behavior event. Assuming that a genuine motive behavior event has been isolated, the next step must consist of including the immediately occurring stimulus and response functions and settings as well as the significant factors of personality equipment and the interbehavioral history of the factors involved.¹

¹ See above, Section II.

The above survey of interpretive constructs available in motivation literature clearly indicates that there is no standard or valid concept concerning this particular form of psychological event. Certainly no evidence is discovered in the observation of psychologists' reactions to alleged motivation events that interpretive constructs have been derived from the study of events. Indeed the evidence points in the opposite direction. Psychologists no doubt are simply imposing traditional notions of springs of action upon various kinds of actual and alleged events. In recent literature this imposition is regarded as justified by the notion of dynamic psychology. Probably the most definite expression of this notion is that of Troland (74, p. 3), who would make the problem of motivation all of psychology except that concerned with structure or the content of mind or consciousness.

VII. MOTIVATION AS EXPLANATORY PRINCIPLE

When the scientist's orientation reaches a relatively high level he aspires to make his constructions explanatory. Fundamentally this signifies his ambition (a) to interrelate the factors analyzed out of or presumed to comprise events, or (b) to interrelate classes of events with other similar or dissimilar events. When the explanatory construction constitutes merely the articulation of the original events this process has traditionally been regarded as the discovery of the causes of happenings. On the other hand, when given events are interrelated with a series of others in a system of lesser or greater comprehensiveness the total construction comprises a theory. When this theory is regarded as well established the scientist considers that he has achieved a law concerning the character and operation of certain events.

The construction of event-principles (causal explanations) and of event systems (theories) as types of explanatory formulae may be differentiated on the ground that the former are presumed to be drawn from the events, while the latter allegedly supply general scientific principles to round out the explanatory system. The value of such event-systems lies in the fact that they can be employed as guides to investigation or as bases for scientific deduction.

In motivation studies causation is for the most part concerned with internal forces or external conditions determining action. In addition, there are theoretical constructs designed to justify the deter-

mining causes or forces. In general, these are borrowed from the physical (energetics) or biological (tissue needs) fields or freely constructed in the form of purposes. Unfortunately, motivational principles (causes) and theories (explanations) present more problems than they can possibly solve. In both cases psychologists employ constructions that must be regarded either as spurious or unnecessary, or both. Certainly there is no explanation of motives as a form of psychological action; rather, motives are regarded as explanations of other actions. This is the case even when the determining motives themselves require to be determined (60).

I. *Causes or Determinants of Action.* Among the various types of motivational causes or determinants proposed are: (a) psychic powers, (b) biological processes, and (c) actual psychological events. Any or all of these are presumed to initiate action and turn it into particular channels. Among the actions so determined some are (a) everyday responses simply requiring to be initiated, (b) teleological processes such as self preservation and (c) the achievement of certain ends in the sense of accomplishing purposes with respect to things and arriving at goals. Among such determinants are drives, urges, wishes, prepotent reflexes or instincts—in other words, internal principles. Others are alleged to be external to the organism. Here are to be listed the factors which condition the organism's action, as incentive, etc.

Basic to all these constructions is the view that psychological performances require causes. Apparent here is the assumption that an organism is some sort of inert body requiring some force to set it going. We have here an unfortunate resort to false physical analogies and a general misinterpretation of modern physical sciences. To clear up these difficulties we must examine the various allegations made concerning internal and external principles.

A. INTERNAL PRINCIPLES

(1) *Pure Internal Principles.* As indicated previously, the entire allegedly new development of motivation studies constitutes for the most part a revival of the instinct or internal-force doctrine. Despite all the substitutions of terms, the performance of various types of experiments, and study of actual behavior, motivation psychology remains simply an attempt to deal with psychological phenomena as

basically powers resident in the acting organism. Since there has arisen a generation which knows not instincts it may not be amiss to indicate some of the difficulties of the instinct construction.

(a) *Causes derived from Naming.* To explain activities by instinct or other internal principles, impulse, prepotent reflex, urge, desire, propensity, need, reaction tendency, determining adjustment, etc., one merely uses a name for an act under the delusion that this explains the act. This sort of principle-assertion has been properly denominated word magic (29). But the more approved form of naming consisting of the assertion that there are neural mechanisms which constitute the principles of action is no less condemnatory. This introduces a new form of word magic which simply substitutes the term neural mechanism for the term instinct, etc. The character of this more sophisticated constructive process is adequately unmasked by the implied assumption that for explanatory purposes it is permissible to create neural mechanisms, even where the neural physiologist cannot discover any. To derive causes by the simple process of rebaptizing neural conduction and integration as explanations of psychological events does more than introduce false constructions. It misconstrues the nature of well authenticated scientific data.

(b) *Faculties as causes.* Patently futile as forms of explanatory construction are the simple assertions that there are internal principles in the form of faculties or powers located in the organism which bring about or cause certain activities. It is hardly necessary to criticize faculty conceptions. What is needed, however, is to realize that they are persistently unwittingly invoked. Especially is this the case in the adoption of faculties in a modified form in more recent writings. Whereas at one time these internal principles were all *sui generis* and inherent in the organism, motives are now divided into unlearned and learned ones (86). Among the latter are cited attitudes, interests, and purposes resident in the individual which are acquired in the person's life conditions. This change of construction reveals a sensitivity to the insufficiency of biological principles and to the claims of societal conditions. Were this change carried far enough the faculties would be left far behind and a definite field construction could be attained.

(2) *Transformed Internal Principles.* Naturally even those psychologists who cling to the old internal powers or drives are not

satisfied with such explanatory constructions. Accordingly they transform these internal powers into biological processes and thus engender the tremendous construction of biological drives. In what sense are tissue needs springs or motives of actions? Even if we consider hunger, sex, and thirst as tissue needs what part do they play in action? Even regarding drinking, eating and mating as the acts under consideration may not the tissue conditions be better regarded as stimuli? And as to making such needs into drives for complex human actions, does not the absurdity become plain of utilizing such phenomena as drives for complex human behavior? Do tissue needs drive man to trade in stocks, make war, marry an heiress, etc.? At best we may regard such biological facts as participative factors in particular actions. We are reminded here of such extravagances as Berman's explanation of Napoleon and the whole course of European history as the hypofunctioning of the pituitary gland (9). A similar frequently expressed fantastic idea is the explanation of war and peace behavior as a function of hormone production.

The alleged biological causes of psychological action illustrate the simplicistic appeal of the internal-principle type of explanation. Can such abstractions as springs of action account for complex human behavior and do we require such simple constructions? Do not such constructions lead us to overlook all the intricate facts of psychological behavior? When it is required to account for specific trends of action we always find numerous factors in every situation.

What scientific basis is there for making biological facts into causal abstractions? Are biological phenomena such general processes or faculties? Because all descriptions or explanations are constructions and therefore abstractions, must we make the data into abstractions likewise? It is, of course, quite proper to think of some factor implicated in the initiation of actions, but what action? Actions are always specific, and so the initiating factors must also be specific.

B. EXTERNAL PRINCIPLES

The same difficulties apply to general external principles such as rewards and punishments, goals, ends, etc. Besides involving an unpalatable notion of simple cause not in accord with modern science, the determining construction forces upon us a number of embarrassing questions. Are there specific drives for all action indifferently or are

there general drives for all particular actions? The dilemma is that motives, drives, urges and propensities are too general and ultimate and therefore offer no principle at all, since such types of principle cannot be connected with particular behavioral facts.

II. *Explanations of Action.* Explanations as constructs of event systems are relatively more remote from original events than the construction of event principles. In a sense the event systems are more remote—that is, higher stage constructions. Simply because they are concerned with relations of events instead of the events themselves allows for freer constructions, though no valid theory-making departs far from the original events.

As we have already indicated, motivational explanations consist primarily of adopting physical analogies, for example, that motivation is energy which makes the organism act. The analogy here is based upon the outmoded assumption that a physical body remains at rest unless some force sets it in motion. Actually, physical phenomena are always in motion. Force is merely a measure of the vectors of motion in a dynamic system. Physics always assumes a dynamic system, and force is simply a metrical abstraction to indicate the particular contributions of the various factors in the system. The basic misinterpretation here is to regard force as an entity which moves things instead of a constructional item of description and interpretation. But even were the case otherwise could such an analogy be applied to biological or psychological phenomena?

Quite the contrary, modern science is not at all sympathetic with the conception of simple causes which bring about simple effects. Students of the logic of science regard this conception as merely an item of intellectual lag harking back to notions of elementary creation. Today, science assumes that mutually operating events as well as the corresponding enumerations and descriptions of such interacting influences must all be treated as factors operating in a field. On this account the elementary notion of some motivating cause for a behavioral effect is not in accord with present scientific trends.

Since motivational literature is pitched upon the level of common sense descriptions and since the deeper penetration into motivation problems proceeds on the basis of the simple cause conception, it is not surprising if we must still face the question concerning the explanation of motivation events.

There is hardly a doubt that the basic motivation construction with its emphasis upon determination has been engendered by the philosophical interest in springs of action. This is true whether we regard motivation interests as simply perennial in psychology or as a recent revival through various contemporary movements.

VIII. CULTURAL ORIGINS OF MOTIVATION THEORY

Numerous intellectual movements among which may be included the postulational principle of mathematics, operational theory of science, and logistics in logic, have brought into prominence the fact that there is a cultural background and basis for scientific practices and theories. Now the realization of this fact should in no sense be interpreted as bringing into science the reign of arbitrariness. That there is no absolute truth does not relieve the scientist from the obligation to carry on a definite enterprise in a rigid and exact way. Nor does the fact that science is subject to various conventionalities and even fads preclude the necessity for adequate criteria of investigation and interpretation.

On the contrary, the elimination of absolutes and the introduction of the notion that science is adventure places a heavier duty upon the scientist. This responsibility can be concretized in the injunction that the scientist must be careful to approach his data and perform his experiments with a minimum of bias derived from the general cultural background and from the more specialized school dogmas.

In the case of the current motivation movement in psychology our exposition so far has shown that the constructions basic both to investigation and interpretation are not derived directly by elaboration and extraction from crude data but from various cultural, that is, philosophical traditions. There can be no manner of doubt that present day motivation constructions have originated in doctrines of animism, free will, and hedonic and other springs of action (73). This continuity may be definitely traced despite the fact that the protopsychologists were interested mainly in theological and ethical problems. Powers and principles of action originally invented as invisible though irresistible movers to conduct in favor or disfavor of man's eternal blessedness became transformed under pressure of cultural circumstances into hedonic states and conative hormones,

instincts, urges, and motives—in short, general principles to account for the activities of individuals.

Under the aegis of physiological psychology these powers became translated into physiological terms. Instincts became reflexes or chains of reflexes. Such alleged physiological substitutes, of course, were regarded as innate sources of action. But even when the biological motives are taken to be actual biological activities, such as hunger, thirst and sex behavior, the principle of determining powers is preserved and cherished.

It is to be expected that students of nonhuman animal behavior who are unaware of the control that cultural traditions exert upon our thinking will protest that their ideas of motives or drives have been suggested by animal behavior. But it should not be difficult to observe the gulf that separates the crude data of such biological organization and functioning as are involved in eating, drinking, and mating from the type of constructions used to describe such actions. When it is further declared that it is the same drives in man that explain his heating systems, governments, crimes and religions (71), then the full significance of the culturally dominated autistic construction stands fully revealed.

So persistent is this cultural item of determining powers that even when writers appear convinced that biologically localized determiners are insufficient to account for the variety of human activities and for the place of societal factors in human behavior, they simply detach the determiners and regard them as independent drives. A prominent instance is Allport's construction of "the functional autonomy of motives or drives" (2, 47). This construction is presumably derived from Woodworth's (84) notion of a mechanism become a drive. Moreover, instead of regarding drives as constructions derived from actual interbehavioral events the traditional drive conception leads Allport to anchor them in another conventional philosophical construction—namely, the ego. Derived drives become independent of their origins, but remain bound to the ego (2, 3, 10). Drives imply some form of ego satisfaction.

The complete measure of the cultural origin of drive constructions may be observed when writers convert entire complex situations into operations of the ego. The existence of critical situations, suggestibility, and the organization of experience are all consequences of

the prior existence of ego drives (14). Fundamental among such drives is the egoistic pursuit of meanings.

IX. MOTIVATION AND SYSTEMATIC PSYCHOLOGY

The impacts of general cultural conditions upon science are reflected, of course, in postulates, hypotheses, types of investigation and theories. In the case of psychology such cultural impacts are evidenced in contemporary psychological systems which mirror the general cultural trends of the time. Such psychological systems may be regarded as the specialized instances of cultural trends. So far as motivation is concerned, the question arises how do motivation constructions articulate with particular psychological systems? There is a reciprocal process here. On the one hand, the general cultural background of psychology influences psychologists of various persuasions to adopt the view of general determiners of action, whereas, on the other, the proponents of different particular systems offer varying particular types of determiners.

Mentalism. From a strictly mentalistic standpoint motivation must, of course, be concerned with some sort of psychic power. To appreciate this type of construction we need not go beyond James and his idea of "the production of movement" (33). In the motivation situation the mentalist is naturally concerned with the instinctive or impulsive rather than the ideomotor or other form of consciousness.

In view of the fact that James himself regarded instincts or what are today called drives as the functional correlates of structure, it is hardly necessary to argue how little mentalistic psychology has to offer in the way of basic psychological motivation theory. Like his predecessors, James begins with simple nonhuman activities and then simply assumes that such biological structure-functions cover all motivation or drive situations.

Behaviorism. The strict behavioristic psychologists have hardly more to offer. The reduction of psychological phenomena to the operation of physiological processes allows for such constructions as tensions and physiological conditions which influence simple action. But here the question arises how these generalized processes can motivate particular actions, specific responses to stimuli. Now when the behaviorist turns to complex human action the difficulties increase. How physiological tensions, tissue needs, and particular physiological

actions such as hunger, thirst, etc., can eventuate in all our complex human action is certainly a mystery. Clearly the whole behavioristic construction reduces itself to general principles which have little bearing on particular cases.

Interbehaviorism. Our exposition so far has indicated the advantage of divesting ourselves of the mentalistic constructions of psychic propensities and of the strict behavioristic, internal, physiological principles. Only psychological constructions which begin with concrete activities can serve as principles accounting for the occurrence and character of particular forms of interbehavior. Such an interbehavioral psychology concerns itself exclusively with interbehavioral fields in which the setting factors operate to facilitate the occurrence of some action rather than its nonoccurrence or some mode of behavior rather than some other. This construction presupposes that in every case we are dealing with a specific behavior segment and that the motivation principle or setting is operational with respect to this particular field. In other words, we eliminate all general principles which are regarded as motives or internal or external springs of action.

Moreover, only this type of interbehavioral construction can be derived from actual crude data which are always behavior in progress. On the basis of this kind of psychological construction the general principle for motivation purposes centers around the setting elements. These may have their effect primarily on the organism or the object. So far as the organism is concerned such setting factors may be fatigue, satiation, hunger or the organism's health. On the side of the stimulus object, such factors may be described as the contrast effect of things, their visibility, audibility, etc. The setting factors are always features of behavior segments along with the stimulus and response functions inhering respectively in the reacting organism and the stimulating object. These functions are potential acts of the object and organism developed in the reactional biography of the individual or the interbehavioral history of such a field or behavior segment.

Not only does the interbehavioral construction serve to eliminate all forces from motivation description, unless forces are considered as the intimate details of a specific behavior field, but further it is claimed that it can do justice to the actual facts of human behavior.

In other words, it enables us to attain valid scientific constructions when dealing with concrete activities of cultural life no matter how artificial and remote from biological organization and circumstances.

Note, however, that the interbehavioral construction outlined is not confined to motivation alone, but is a necessary descriptive and explanatory device for handling all psychological phenomena. The question then remains why we should consider the factors accounting for all actions as particularly motivational. On this basis motivation becomes the name for all of psychology. There is really no objection, if it is convenient, to use the term *motivation* at will for any event casually or experimentally observed. As long as all powers, forces, and general determining principles are eliminated the choice of terms is of no great moment. On the other hand, since there are already terms available for actual interbehavioral events it may add to the clarity of our descriptions to isolate a particular datum which merits classificatory differentiation. The writer submits that only the interbehavioral type of construction allows for a distinctive and completely objective motivation event.

X. SIGNIFICANT FACTORS IN MOTIVE CONSTRUCTION

Granting that motivation constitutes a unique type of behavior segment, a definite motivation construction is called for. Such a construction not only involves the development of a descriptive basis for interpretation and explanation, but also must provide for the differentiation of motivation from other interrelated segments. One of the primary characteristics of motivation behavior segments is their durability. Motivation interbehavior presupposes a type of situation or field in which the component action functions have more than a momentary existence. In this sense the characterization of motivation as set is altogether appropriate, provided, of course, we at once add that motivation behavior constitutes a set or preparedness for immediate action—something to be completed in a fixed time period.

Though we insist that current, objective, interbehavioral field psychology³ is a new type of psychological construction, we should not

³ For the differentiation between various psychological field conceptions cf., Kantor, *Current Trends in Psychological Theory*, *Psychol. Bull.*, 1941, 38, 29-65.

ignore the valuable work of older psychologists in isolating the crude data of motives. We need only modify their constructions, couched in terms of mental states leading to overt action, to read that motives as preparatory and promotion acts constitute unique behavior segments, being inclined toward, anticipating, being set for. In this special sense motivation interbehavior may be regarded as conditional actions, as behavior segments influencing other actions and conducing to their performance as preferential activities. To motivate an individual, therefore, is to place him in a particular field, one in which he will more probably than not do some preferred action.

As we have already indicated, any construction must reach down to the basic stimulus and response functions essential for psychological formulations. Furthermore, we are required to take into account the personality equipment of the motivated individual. No incentive or other stimulus function of an object or setting factor operates in a behavior field unless it is implicated with some equipment of the particular individual. For the non-smoker no circumstances motivate the choosing of a particular brand of cigar. Hence the stress of the specificities of motivation situations. It is here that we may discover the grain of truth in the recent resuscitation of ego-needs in motivation discussion.

The interbehavioral construction further provides that each motive instance or situation constitutes a specific field. In other words, we must consider the particular stimulus object and particular setting. Thus we cannot regard motivation factors as general setting determiners. This does not mean that we can dispense with the construct of special inducements for doing a particular act. To be motivated is to perform some action that otherwise would not be done. Before I buy bonds for which I must borrow money I must become motivated. This means that I must first perform an action resulting in the building up of an attitude that bonds will help win the war; thus the bonds interactionally take on the added stimulus functions of war winners.

When we isolate particular segments we find that motivation behavior simulates general purposive action in some respects; yet the differences are important and clear. As differentiated from general purposive behavior, motivation involves some immediate consummatory performance. This difference stands out when we consider the

varying stimulus objects and situations involved. A general purpose implies definite and perduring personality equipment which is not the case in motivation interbehavior. X has developed a general purpose to invest in real estate, but at this moment he inhibits or thwarts that purpose action in view of an immediate situation calling for a motive to act otherwise and the immediate performance of that act.

Not only is a motive not merely a name for any condition (incentive, instigation, inducement, facilitation) for eliciting an act, as suggested in the proposition that motivation is getting action from someone who is able to perform it (86), but it is also not merely any behavior event preceding another action event. It is sometimes said that curiosity, interest or uneasiness lead to action. We repeat that motive interbehavior constitutes specific behavior segments different from curiosity, interest, etc., even when those terms refer to actual behavior segments.

Further to illustrate the unique character of motivation behavior let us indicate the contrast between motive, voluntary and volition behavior segments.⁴ As compared with the former, motivation behavior segments do not involve competition and conflict of stimulus functions, whereas in contrast with volition behavior there is no prolongation or duration of action. Instead, there are interrelated features of a pattern of action, such that one phase operates in the effective performance of the whole.

In sum, an objective field construction of motivation, stressing as it does the isolation and description of specific instances of actual interbehavior, not only allows for the differentiation of events, but also for the collation of varieties of actions carrying the same (similar) specifications. At one and the same time this construction covers all the varieties of human motive behavior performed under cultural conditions and likewise the motive action-events participated in by nonhuman organisms under noncultural auspices.

⁴ See Kantor, *Principles of Psychology*, chaps. 15 and 25.

XI. SUMMARY

The current motivation situation in psychology presents a picture as confused as it is complex. Looked at casually it seems to indicate a growing interest in a new phase of investigation with many supporting experiments. This motivation movement is presumed to be concerned with the causal aspect of psychological events and to be based upon the same fundamental operations as energetics in physics.

A closer scrutiny of the motivation situation reveals a number of exceedingly unsatisfactory features. In the first place, motivation study is activated by the popular explanatory conception of why acts occur or how they are elicited. Again, the motivation movement is founded upon the traditional philosophical principle of springs of action modified into terms of drives and instincts. And, finally, these constructions have been imposed upon actual events and not derived from them. Consequently the experiments performed under motivation headings are arbitrarily associated with these popular and traditional constructions.

The notion that there are general principles initiating and regulating all psychological action results in numerous translocations and misinterpretations. Not only are the necessary psychological constructions reduced to illegitimate abstractions, but also data are unordered and analogically treated. On the whole, it is fair to say that motivation literature discloses numerous violations of adequate scientific procedure. In the following paragraphs we list a number of the more important instances.

I. No Adequate Isolation and Definition of Data

- (a) Purely biological actions are regarded as psychological motivation behavior.
- (b) All sorts of psychological acts are unnecessarily and improperly grouped as motive behavior.
- (c) Preanalytic and analytic data are confused.
- (d) No differentiation is made between motive acts and motive conditions.
- (e) Actual motivation events in human and animal behavior situations are covered up and untreated.

II. Linguistic Analysis and Synthesis in Motivation

Probably more than most psychological areas the motivation domain is replete with terminological and descriptive difficulties. These are distributed among the logical as well as the primarily semantic divisions.

(a) Popular and scientific terms are interchanged to the detriment of motivation investigations.

(b) Motivation literature is built upon the basis of autistic constructions rather than references to actual events.

(c) By the use of such names and symbols as motives, drives, and energy, actual biological and social psychological behavior is converted into powers and forces.

(d) Linguological arguments are employed to support the reintroduction of instincts into psychological interpretation and explanation.

III. Experimental Investigation of Motives

Grouped under the motivation heading is a heterogeneous array of experimental investigations, a situation following from the lack of proper selection and differentiation of data. Not only are the most important experiments performed in the motive tradition really not associable with authentic motive behavior, but even the series of non-motivation investigations does not show any genuine similarity. Though there is no objection to the use of the term motivation as a classifying category for even a heterogeneous series of events we cannot but deplore the resulting notion that psychological organisms are driven by tendencies, drives, and forces. It is probably true that insofar as writers build up coherent abstraction-systems concerning motives as energy, powers, and determiners, they cannot readily connect them with concrete behavior facts.

IV. Interpretive Constructions in Motivation

Although scientific interpretation constitutes an enterprise of evaluating events on the basis of investigative findings, motivation literature indicates a contrary process. Construction from the pre-experimental period are simply imposed upon crude and analytic data. Accordingly, the interpretive construction of motives consists of the ascription of

moving power to every variety of action, stimulus, condition, relation, end, purpose, and even names.

V. *Explanation of Motivation*

On the whole, explanation in motivation literature does not comprise the construction of theory concerning a distinctive form of behavior (intending, motivating), but rather the assertion that motives explain every variety of performance. This procedure results in a number of confusions and misconstructions as indicated by the following samples.

(a) Biological events are regarded as determiners of other biological or psychological events.

(b) By baptizing biological actions and conditions as motives, drives, and instincts they are converted into general explanatory principles for all sorts of particular actions.

(c) When biological actions are converted into explanatory principles, parts of events are made into causes of the remainder.

(d) When biological events and conditions are not regarded as forces but conditions they are nevertheless not treated as actual conditions. As a result, genuine field factors in actual events are overlooked.

(e) Biological actions and conditions are presumed to account for and explain complex human activities and circumstances.

VI. *Cultural Origin of Motivation Theory*

Motivation literature clearly indicates the striking contrast between the description of how animals act under various conditions and the manner in which such behavior manifests determining principles or causes. This contrast is shown equally as well by the translation of physiological processes into determiners as by the reintroduction of historical instinct and other springs of action doctrines. It may well be concluded that motivation constructions are derived from traditional doctrines of action-principles (free will, determiners) rather than from actual investigation of psychological events.

VII. *Motivation and Systematic Psychology*

After considering the question whether the present unsatisfactory motivation situation might be ascribed to the faulty status of systematic psychology, the suggestion is made that an interbehavioral field theory may operate effectively in clearing up this situation.

VIII. *Significant Factors in Motivation Construction*

Taking the interbehavioral field theory as a starting point the writer proposes that motivation constitutes a clearly definable mode of action separable from other actions and subject to handling in a completely objective manner. Similarly, each of the other types of action and their conditions conveniently grouped under the motivation heading can be properly interpreted and explained.

KEY TO FIGURES

FIG. 1. THE BEHAVIOR SEGMENT.

Although every factor in an event is equally important it may still be said that a psychological event or psychological interbehavior centers about the mutual interaction of stimulus and response functions, represented by the double headed arrow. These functions localized in the responses of organisms and stimulations of things (stimulus objects) become factors in psychological events when organisms and objects become interrelated in a behavioral field. This coming into contact of the object and organism marks the beginning of the interbehavioral history of the two. This contact under specific setting and mediating (M) circumstances eventuates in the building up of response functions by the organism and stimulus functions by the object. This reaction evolution called reactional biography (RB) and stimulus function evolution (SE) may result in the unchanged successive reoccurrence of events or fields in time, or disappear through various interbehavioral conditions. In many instances it is proper to say that the original functions give place to other response and stimulus functions. While in the diagram both the interbehavioral history and the RB and SE lines continue through succeeding psychological events or behavior segments, at least the RB and SE lines should be broken off past the current behavior segment or interbehavioral field or event when particular response and stimulus functions disappear.*

FIG. 2. THE INVESTIGATIVE EVENT

Fundamentally the psychological investigative event constitutes the interbehavior of the investigator with a behavior segment or psychological event as diagrammed in Fig. 1. Just as the event investigated is conditioned by the interbehavioral history of the organism and object, so the investigator is more or less influenced by his antecedent intellectual background. This interaction of the investigator and the crude event is represented by the double headed arrow, an interaction which is further influenced by other factors in a field such as the general conditions prevailing in the investigative milieu as well as by MM, the particular instruments and techniques of investigation.

FIG. 3. VARYING SOURCES OF SCIENTIFIC CONSTRUCTION.

The solid line with the arrow pointing to the left represents scientific construction derived from the crude data through investigative contacts. The other two lines indicate that the constructions are imposed upon the original or crude data either in conjunction with investigative tests or bypassing investigation altogether. In the former of these two cases some resemblance to scientific hypothesis is maintained, but none in the latter. Instead, the exclusive source of the constructions is the general and specific cultural background of the constructor. These three extreme possibilities suggest various constructional combinations resulting from varying components of investigative contacts and cultural influences.

* For a comprehensive treatment of the behavior segment in particular and interbehavioral psychology in general consult Kantor, *Principles of Psychology*, N. Y., Knopf, 1924-26; *A Survey of the Science of Psychology*, Bloomington, Principia Press, 1933; and *Preface to Interbehavioral Psychology*, *Psychol. Record*, 1942, 5, 173-193.

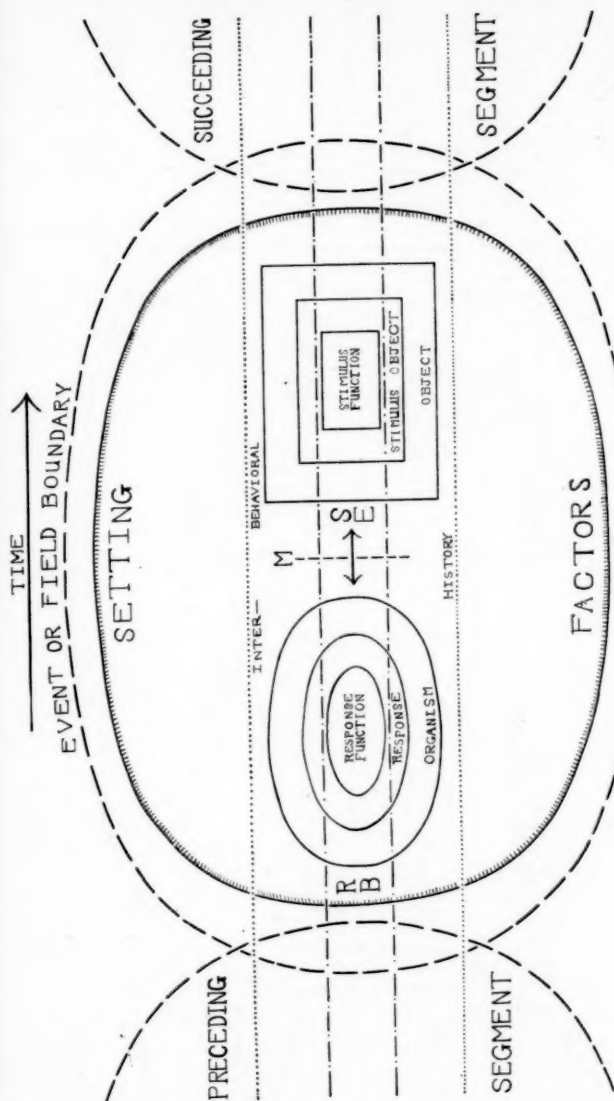


FIG.1. THE BEHAVIOR SEGMENT

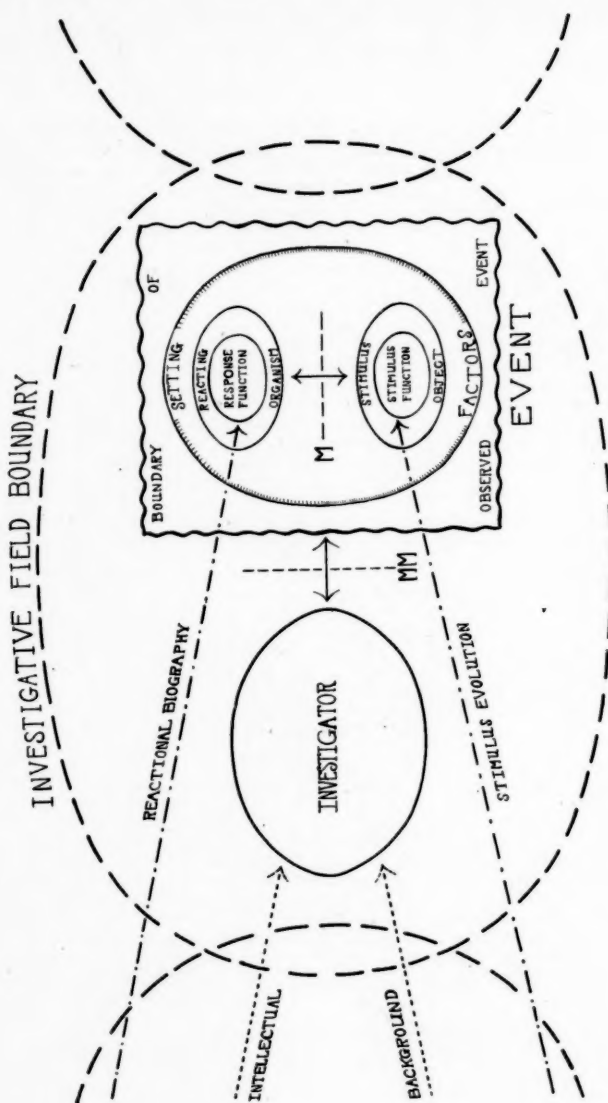


FIG.2. THE INVESTIGATIVE EVENT

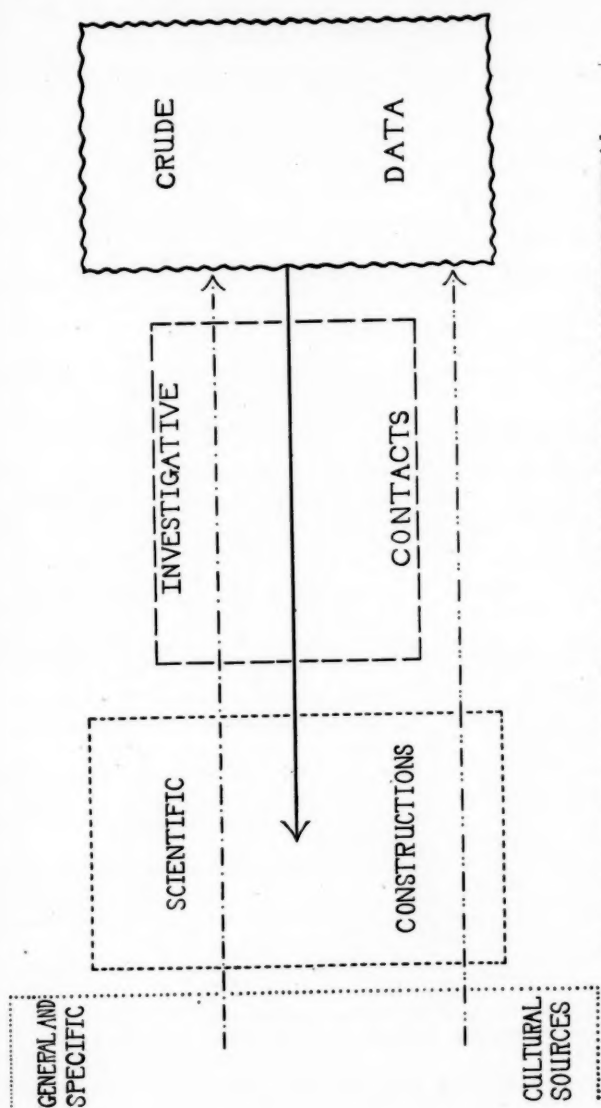


FIG.3. VARYING SOURCES OF SCIENTIFIC CONSTRUCTION

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